



Patent Application of
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for

TITLE: 'The ROOF-RAKER'

CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON COMPACT DISC

Not Applicable

REFERENCE TO MICROFICHE INDEX

Not Applicable

BACKGROUND OF THE INVENTION

Field of the Invention:

Our invention relates to roof maintenance, specifically to an improved method of removing pine straw and leaf debris from roofs of houses.

State of the Prior Art:

As can be seen by reference to known raking implements covered by U.S. Patents, the prior art is replete with myriad and diverse rake constructions. While all of the aforementioned prior art constructions are more than adequate for the basic purpose and function for which they have been specifically designed, they are uniformly deficient with respect to their ability to efficiently and safely remove pine straw and leaf debris from pitched roof surfaces, particularly from recessed V-shaped roof areas where two pitched roof planes meet.

Most of the known raking implements covered by U.S. Patents are designed for ground use by a person standing at ground level. Such lawn and leaf rakes

State of Prior Art cont'd.

...are described as having a plurality of tines or teeth. Some of these rakes are fan-shaped, others have a horizontal crosshead or bar from which tines or teeth extend in a straight line. A few examples of fan-shaped rakes are; E.A.Canalizo, U.S. Patent 2,488,802, J.H.Horstman, U.S. Patent 1,887,480 and Rugg, U.S. Patent 4,057,953. The design and structure of such fan-shaped rakes usually include a restricting bar across the body of the tines which maintains spacing of the tines but limits their flexibility. Such limited flexibility makes such rakes unsuitable for removal of pine straw and leaf debris from roof surfaces, particularly from recessed V-shaped roof areas where two pitched roof planes meet. And it is in such V-shaped angled roof areas where pine straw and leaf debris tends to gather and remain.

A few examples of crosshead rakes, which feature a plurality of tines or teeth of uniform length and extend from a rigid horizontal bar or cross-piece are; Riley II et al, U.S. Patent 6,640,531 B1, Milbury, U.S. Patent 6,131,381 and Kaufman, U.S. Patent 5,425,226. Such rakes, because of their complete lack of flexibility and rigid construction are unsuitable for the purpose of removing pine straw and leaf debris safely and efficiently from roofs. The pointed and often sharp teeth of such rakes have the added disadvantage of being able to cause damage to roof surfaces.

There are three known patents covering rakes designed for use on roofs of houses. One is Phillips, U.S. Patent 4,791,780, specifically designed to remove scraps and pieces of construction materials such as wood, metal and shingle debris. This raking device has two sets of rigid tines facing in opposite directions from each other. This raking implement requires an operator, while standing on a roof, to move the tines in one direction or the other by turning a control mechanism in the rake handle. The design and structure of this device make it completely unsuitable to remove pine straw and leaf debris safely and efficiently,

State of the Prior Art cont'd.

...particularly from recessed V-shaped roof areas where two pitched roof planes meet.

The other known roof-rake patents are L.A.Schroeder, No.3,091,790 and Whitehead et al, 6,018,894, both of which cover raking devices designed to remove snow and ice from roofs of houses. The rigid construction and horizontal blade design of these devices, which more closely resemble a shovel than a rake, are intended to scrape and slide snow and ice down and off a roof. Such design renders such devices impractical and unusable for the purpose of removing pine straw and leaf debris from roofs of houses.

None of the raking devices described or referenced herein, or any others we are aware of, were either designed or intended to remove pine straw and leaf debris from roofs of houses. Nor, based on their own detailed descriptions, could they reasonably be expected to perform such a function safely and efficiently.

Yet many homeowners, for the want of something better, continue to use some of these rakes to try to clear their roofs of pine straw and leaf debris. The failure of such rakes to perform safely and efficiently is especially obvious when trying to clear such debris from V-shaped roof areas where two pitched roof planes meet.

OBJECTS AND ADVANTAGES

Homeowners have a choice of 4 options when confronted with the problem of removing pine straw and leaf debris that gathers and remains on roofs of houses;

- 1) use a lawn or leaf rake
- 2) use a mechanical leaf-blower
- 3) hire someone to remove pine straw and leaf debris
- 4) ignore the problem and allow pine straw and leaf debris to gather and remain on roof.

OBJECTS AND ADVANTAGES cont'd.

The primary object of the present invention, when attached to a lightweight telescopic pole, is to provide a safer, easier, more efficient and economical method of removing pine straw and leaf debris from roofs of houses. Accordingly, several objects and advantages are;

- a) provide a roof-raking device with deeply curved self-adjusting tines capable of flexing and forming to all types of roof surfaces, including recessed V-shaped roof areas where two pitched roof planes meet
- b) provide a roof-raking device that can be operated by a person while standing on the ground or on a ladder
- c) provide an easy to handle roof-raking device that can be operated safely by a person of almost any age, from young teen-agers to elderly retirees
- d) provide a roof-raking device that eliminates or minimizes the risk of serious personal injury that can result from climbing and walking up, down and across a pitched roof
- e) provide a roof-raking device having a plurality of tines with convex tips designed to avoid damage to roof surfaces
- f) provide a roof-raking device that eliminates possible damage to roof surfaces caused by excessive walking
- g) provide a one-piece injection molded device that is economical to produce and does not require adjustment, repair or replacement of parts
- h) provide a roof-raking device that allows a homeowner to maintain a healthy attractive roof that is free and clear of pine straw and leaf debris that can cause mildew, mold and ugly discoloration if not removed

OBJECTS AND ADVANTAGES cont'd.

- i) provide a roof-raking device that can save homeowners hundreds of dollars annually in service costs related to periodic removal of pine straw and leaf debris from roofs, and hundreds more in service costs related to chemical cleaning or powerwashing of roof stains
- j) provide a roof-raking device whose use, over time, can affect the condition, appearance and value of a house
- k) provide a roof-raking device that can help prevent roof rot and decay that can ultimately lead to leaks and costly repairs.

SUMMARY

A roof-raking device featuring a plurality of deeply curved self-adjusting tines capable of flexing and forming to all types of roof surfaces and angles. Designed to be attached to a lightweight telescopic pole, our device can be operated safely from ground level by almost any age, from young teen-agers to elderly retirees.

BRIEF DESCRIPTION OF DRAWINGS

Fig.A...is a top plan view of The ROOF-RAKER showing the central housing support structure, underlying interior support walls, female flange fitting, and tines with underlying support ridges.

Fig.B...is a side view showing the top surface plate, front wall, interior support wall, female flange fitting, deeply curved tines and lower support ridges of the tines.

Fig.C...is a bottom view showing convex front wall, interior and exterior support walls and female flange fitting of central housing support structure, plus approximate length and width of tines and lower support ridges of tines.

Fig.D...shows only front view of convex tine tips

Fig.E...is 3/4 overhead perspective drawing showing the central housing support structure and tines.

REFERENCE LETTERS AND NUMERALS

Fig.A...Top View

Fig.B...Side View

Fig.C...Bottom View

Fig.D...Front View Showing convex Tine Tips

Fig.E...Perspective View

#2 Tine

#2a Lower Support Structure

#4 Tine

#4a Lower Support Structure

#6 Tine

#6a Lower Support Structure

#8 Tine

#8a Lower Support Structure

#10 Tine

#10a Lower Support Structure

#12 Tine

#12a Lower Support Structure

#14 Tine

#14a Lower Support Structure

#16 Tine

#16a Lower Support Structure

#18 Tine

#18a Lower Support Structure

#20 Central Housing Support Structure

#22 Female Flange Fitting

#24a External Side Support Wall

#24b External Side Support Wall

#26 Interior Longitudinal Support Wall

#28a Interior Latitudinal Support Wall

#28b Interior Latitudinal Support Wall

#30 Convex Front Support Wall

#32 Top Surface Plate

#34 Front Face of Convex Front Support Wall

#36 Cross Section of Tine #18

DETAILED DESCRIPTION OF DRAWINGS

A unique and novel feature of our roof-raking invention is inherent in the design and structure of the flexible, deeply curved tines 2 - 18 which form a wedge-shaped configuration, i.e. the positional relationship of the tine tips, having the capability of aligning to any horizontal pitched roof plane, as well as the capability of flexing and forming to both sides simultaneously of any V-shaped angles where two roof planes meet. The ROOF-RAKER is a one-piece injection molded device fabricated of flexible, resilient material having molecular shape memory. The rake-head has a central housing support structure 20 (Figs.A.B.C.D.E.). The central housing support structure 20 has two non-parallel external side support walls 24a and 24b (Figs.A.B.C.E.) and one convex front support wall 30 (Figs.A.B.C.E.). There are two interior latitudinal support walls 28a and 28b (Figs.A.B.) and one interior longitudinal support wall 26 (Figs.A.B.C.). Within the central housing support structure 20 is a threaded female flange fitting 22 (Figs.A.B.C.). Fitting 22, located at the back of the central housing support structure 20 accomodates a male threaded pole. The central housing support structure 20 is covered with a top surface plate 32 (Figs.A.B.E.). Extending from the front support wall face 34 of the central housing support structure 20 is a plurality of deeply curved tines 2 - 18 (Figs.A.B.C.D.E.). The top surfaces of all tines 2 - 18 (Figs.A.E.) are smooth. The bottom surfaces of all tines 2 - 18 have a lower support ridge 2a - 18a (Figs.B.C.E.). These lower support ridges start at the front of the support wall face 34 (Figs.B.E.) and taper out to a point near the convex tips of the tines. The center tine 10 is the longest tine. Tines 2 and 18 are equal in length, width and curve radius. Tines 4 and 16 are equal in length, width and curve radius. Tines 6 and 14 are equal in length, width and curve radius. Tines 8 and 12 are equal in length, width and curve radius. Tines 2 - 6 and 14 - 18 are all narrower than tines 8 - 12. The lower support ridges for all tines 2a - 18a start at the front support wall 34 and taper to a point near the convex tip of each tine. The depth of the lower support ridges of tines 8a - 12a are deeper at the front wall support face 34 (Figs.C.B.) than the lower support ridges of tines 2a - 6a and 14a - 18a.

THEORY OF OPERATION

The ROOF-RAKER employs a design feature that is novel and unobvious. The tines of our device have been designed to function in a manner that allows them to self-adjust simultaneously to both planes as well as the apex of any V-shaped angle to be found in roof construction, as well as to any horizontal pitched roof surface.

OPERATION

The ROOF-RAKER has a female flange fitting 22 at the back of the central housing support structure 20 to which a lightweight telescopic pole can be connected. Once attached to a connecting pole The ROOF-RAKER is then extended to a roof to be cleared of pine straw and leaf debris. The average one-level house, depending on height and pitch of roof, can be cleared of pine straw and leaf debris by a person standing at ground level or on a ladder. When The ROOF-RAKER is placed on a flat pitched roof plane, tines 2 - 18 align horizontally to that surface. When The ROOF-RAKER is lowered into a recessed V-shaped roof angle where two roof planes meet, tines 2 - 8 and 12 - 18 flex and form simultaneously to both planes of such V-shaped angle. As tines 2 - 8 and 12 - 18 are forming to both planes of a V-shaped angle the center tine 10, which is the longest tine, descends into the apex of the angle as slight pressure is applied to the upper surface of connecting pole. To complete the operation the user then slowly draws pole downward, gathering and tumbling pine straw and leaf debris to and off edge of roof. The deeply curved design and structure of tines 2 - 18 facilitate this clearing action.